APPLICATION

FOR

UNITED STATES LETTERS PATENT

TITLE: PACKAGING CLOSURES

APPLICANT: HOWARD A. KINGSFORD, WILLIAM H. SHEPARD AND JAMES W. BABINEAU

CERTIFICATE OF MAILING BY EXPRESS MAIL

Express Mail Label No. EV 331 654 615 US

December 2, 2003

Date of Deposit

PACKAGING CLOSURES

TECHNICAL FIELD

This invention relates to releasable packaging closures.

BACKGROUND

Product packaging is used for transporting, storing and displaying a multitude of materials including foodstuffs and bulk materials, for example. It is often a requirement of these packages that they be opened and reclosably secured repeatedly without the use of a multiple fastening devices.

Closing and securing product packaging often entails the application of adhesive tape. With cardboard containers, the upper flaps are folded into overlapping or adjacent contact and adhesive tape is applied to secure the flaps together. When the container is to be opened, the adhesive tape is generally either cut or stripped off, which necessarily limits the practical reuse of the container. Reclosure of the container may not be possible if the flaps were damaged from stripping off the adhesive tape. Alternatively, if the flaps remain undamaged, the adhesive tape must be reapplied to effect closure of the package.

SUMMARY

According to one aspect of the invention, a fastener product is provided including a first base having an inner face and an outer face opposite the inner face, the first base comprising a first array of fastening elements on a first portion of the inner face and an adhesive coating on a second portion of the inner face, a second base having an inner face and an outer face opposite the inner face, the second base comprising a second array of fastening elements releasably engageable with the array of first fastening elements of the first base on the outer face and an adhesive coating on the inner face of the second base, the first portion of the first base at least partially overlaps the second base, such that the fastening elements of the first base engage the fastening elements of the second base, and wherein the first base is positioned adjacent to the second base to enable the first array of fastening elements to engage the second array of fastening elements.

In one embodiment, one of the first or second arrays of fastening elements are

loop-engageable fastening elements and the other are hook-engageable fastening elements. In some cases, the loop-engageable fastening elements are integrally molded with the first base. In some presently preferred embodiments, the adhesive coating of the first base and the adhesive coating of the second base lie in substantially the same plane.

According to another aspect of the invention, an elongated closure label is provided for reclosably securing an opening defined between adjacent surfaces of a substrate, the closure label including a first array of fastening elements extending from a first portion of an inner surface of a first base, the first base comprising a backing layer permanently affixed to a second portion of the inner surface of the first base for permanent attachment of the first base to a substrate surface on one surface of the opening, with first portion of the first base extending across the opening, a second array of fastening elements extending from a first portion of an outer surface of the second base, the second base comprising a backing layer permanently affixed to a second portion of the inner surface of the second base for permanent attachment of the second base to a substrate surface on the other surface of the opening, and wherein the first base is positioned adjacent to the second base to enable the first and second arrays of fastening elements to reclosably secure the opening of the substrate.

According to another aspect of the invention, a package having a reclosable frangible section is provided including a closure strip having a first portion, a second portion, a foldable region therebetween and a back face carrying an adhesive layer along the first portion, the closure strip being permanently affixed to a first side of the frangible section along the second portion, the closure strip comprising an array of first fastening elements carried on the first portion of the back face of the closure strip, a closure base permanently affixed to a second side of the frangible section and arranged to be substantially overlapped by the first portion of the closure strip, the closure base having a back face carrying an adhesive layer and a front face, the closure base comprising a second array of fastening elements carried on a portion of the front face of the closure base, and wherein the fastening components are arranged upon the outer surface of the package to enable the first and second fastening elements to come into contact to reclosably secure the frangible section of the package.

In one embodiment, the package is applied to a box having folding flaps for application of the back faces of the closure strip and closure base. In some cases, the package is a bag suitable to be filled from the top. The bag can include gusseted portions for application of the

back faces of the closure strip and closure base. In another embodiment, the first fastening portion is configured and adapted to form a spout for pouring the contents of the package contained therein. The spout can be adapted for receiving a fitment. The fitment can comprise an array of third fastening elements for engaging the first fastening elements of the closure strip. In other embodiments, the package includes a breakable film or frangible burst membrane over the fastener to provide a tamper-evident container. Alternatively, the breakable film or perforated frangible burst membrane may be provided under the fastener. In one embodiment, the burst membrane may also include preferential tear lines to facilitate easier opening of the membrane.

According to another aspect of the invention, a method of releasably securing an opening of a package is provided. The method includes the steps of providing a closure label according to the first aspect of the invention, removing a release liner from the adhesive layer, applying the closure label to an outer surface of the package over the opening generally along a single plane and separating the first array of fastening elements from the second array of fastening elements thereby providing access to the contents of the package.

According to still another aspect of the invention, a package having a reclosable opening is provided including a closure strip having a first portion, a second portion, a foldable region therebetween and a back face, the closure strip is permanently affixed to a first side of the opening along the second portion and includes an array of first fastening elements carried on the first portion of the back face. The package also includes a closure base permanently affixed to a second side of the opening that is arranged to be substantially overlapped by the first portion of the closure strip, the closure base having a back face and a front face and including an array of second fastening elements carried on a portion of the front face. The opening of the package is adapted for receiving a fitment which includes a third array of fastening elements positioned to engage the first fastening elements of the closure strip to secure the fitment to the package.

In various embodiments, the invention relates to closures for containers that can form reclosable store or shelf seals, and which, after original opening, form a pantry seal, permitting convenient, repeated opening and closing of the container.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

FIG. 1A is a perspective view of a fastener according to the invention attached along separate flaps of a reclosable package.

FIG. 1B is a side view of the fastener of FIG. 1A.

FIG. 2 is a perspective view on a fastener being applied along separate flaps of a reclosable package.

FIGS. 3A and 3B schematically depict the fastener attached to a bag in closed and open positions.

FIGS. 4A and 4B schematically depict the fastener attached to the gusset portion of a gusseted bag illustrating closed and open positions.

FIGS. 5A and 5B schematically depict the fastener attached to an open or frangible section of a bag, illustrating closed and open positions.

FIGS. 6A to 6H schematically depict various applications of a fastener attached to a container.

Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

Referring first to FIGS. 1A and 1B, a fastener 100 includes a closure strip 105 and a closure base 110 for releasably engaging first and second portions of a substrate 115, 120. In one embodiment, the closure strip and base 105, 110 include a thin, sheet-form resin base of polyethylene, for example. In some applications, first and second portions of the substrate 115, 120 are flaps of a cardboard box having a gap 123 extending along the edges of the flaps 115, 120. Other types of containers could be secured with the fastener 100.

The closure strip 105 is affixed to the first substrate portion 115 along a first portion 125 of the closure strip 110 with a first adhesive layer 130 applied to a back face 135 of the closure strip 105. An first array of fastening elements 140 is attached to the back face 135 of the closure strip 105 along the second portion 145. A foldable section 150 flexibly connects the first and second portion 125, 145 of the closure strip 105. The foldable section 150 is a bendable region in the closure strip 105, which may include for example, a living hinge, a fold or crease along the closure strip 105. The closure base 110 is affixed to the second portion of substrate 120 with a second adhesive layer 155 applied to a back face 157, of the closure base 110. An second array

of fastening elements 160 is attached to the back face 157 of the closure base 110 along a first portion 170. In some presently preferred embodiments, one of the first or second arrays of fastening elements 140, 160 are loop-engageable fastening elements and the other are hook-engageable fastening elements. In some embodiments, the loop-engageable fastening elements are integrally molded with the closure strip 105 or closure base 110.

In one example, a single release liner (not shown) covers the first and second adhesive layers 130, 155 until the fastener 100 is applied to the substrate 115, 120. In other examples, the fastener 100 is wound or coiled and a front face 175 of closure strip 105 and the nonoverlapping portion of a front face 180 of the closure base 110 serves as the release liner for the adhesive layers 130, 155.

Referring now to FIG. 2, the fastener 100 is applied along the edges of the first and second portions of the substrate 115, 120 like standard packaging tape to form a reclosable seal. Advantageously, the first and second adhesive layers 130, 155 lie generally along a single plane defined by the first and second portions of the substrate 115, 120 when in a closed position, as illustrated in FIG. 2. In one example, a release liner (not shown) is removed from first and second adhesive layers 130, 155, and the fastener 100 is rolled or paid out over the flaps of the cardboard box 115, 120 to overlay the gap 123. In an alternative example, the fastener 100 includes no separate release liner; the front faces 175, 180 of the first and closure bases 105, 110 provide a release lining to the adhesive layer 130, 155 when the fastener 100 is in a wound configuration. After the fastener 100 is applied, the first and second portions of the substrate 115, 120 are releasably sealed. In some applications, the fastener 100 is supplied as a separate item and would not be applied to the flaps 115, 120 until necessary to releasably close the cardboard box.

To separate the portions of the substrate 115, 120, the first array of fastening elements 140 is disengaged from the second array of fastening elements 160 without disturbing the first and second adhesive layers 130, 155 between first and closure bases 105, 110 and the first and second portions of the substrate 115, 120. To reclose the first and second portions of the substrate 115, 120, the second portion 145 of the closure strip 105 is folded generally along the foldable section 150 toward the closure base 110, such that the first and second arrays of fastening elements 140, 160 (FIGS. 1A and 1B) facially contact one another and are engageably connected.

Referring now to FIGS. 3A and 3B, a fastener 200 is applied to a bag 205 as shown. The fastener 200 includes a closure strip 210 and a closure base 215 for releasable closure of an opening 220 in the bag 205. The fastener 200 is affixed to the bag 205 to overlap the opening 220. The closure strip 210 is affixed adjacent to the opening 220 along a fixed end 223. A first array of fastening elements 225 is attached to a back face 230 along a free end 235 of the closure strip 210. The closure base 215 is affixed adjacent to an opposite side of the opening 220 and includes a second array of fastening elements 240 attached to a front face 245. The closure strip 210 and closure base 215 are positioned such that the first fastening components 225 releasably engage the second array of fastening elements 240 for releasable closure of the opening 220. Preferably, the fastener 200 is of unitary construction and is applied to the bag 205 as a single label with the strip and closure bases 210, 215 connected together with a perimeter gasket 247. The gasket 247 is sized and shaped for attachment around the opening 220 of the bag 205.

A frangible burst membrane (not shown) may be provided over the fastener 200 to preserve the freshness of the contents before the initial opening of the bag 205 for transport, retail display, and to provide a temper-evident indicator. Alternatively, the burst membrane may be provided under the perimeter gasket 247 of the fastener 200 to cover the opening 220 of the bag 205.

In operation, the fastener 205 is opened by separating the free end 235 of the closure strip 210 from the closure back 215 thereby disengaging the first array of fastening elements 225 from the second array of fastening elements 240 to substantially reveal the opening 220 of the bag 205. To reclose the fastener 205 and the opening 220 of the bag 205, the free end 235 of the closure strip 210 is lifted upward across the opening 220 to re-engage the first and second arrays of fastening elements 225, 240.

Referring now to FIGS. 4A and 4B, another bag 250 has two opposing side expansion gussets 255 (one hidden from view). A closure label 260 is applied over an opening 265 disposed within the gusset 255 with an adhesive layer (not shown) or other attachment means. The closure label 260 includes a closure flap 270 and a closure base 275. A first array of fastening elements 280 is attached to a back face 285 of the closure flap 270. A second array of fastening elements 290 is attached to a front face 295 of the closure base 275. The closure base 275 includes an aperture which overlays the opening 265 of the bag 250. When the closure label 260 is in the closed position, the closure flap 270 facially contacts the closure base 275 such that

first fastening components 280 releasably engage second fastening components 290. In operation, the fastener 300 is opened by separating the back face 285 of the closure flap 270 from the front face 295 of the closure base 275 thereby disengaging the first array of fastening elements 280 from the second array of fastening elements 290. To reclose the fastener 300 and the opening 265 of the bag 250. To reclose the fastener 300, the closure flap 270 is lifted upward to extend across the opening 265 to re-engage the first and second arrays of fastening elements 280, 290.

A frangible burst membrane (not shown) may be provided over the closure label 260 to preserve the freshness of the contents before the initial opening of the bag 250 for transport, retail display, and to provide a tamper-evident indicator. Alternatively, the burst membrane may be provided under the closure label 260 across the opening 265 of the bag 250. Advantageously, the closure flap and closure base 270, 275 can include perforation or folds along a vertical axis corresponding to the position of a gusset fold 298 to improve contact of the closure label 260 with the gusset 255.

Referring now to FIGS. 5A and 5B, a fastener 300 includes a first closure flap 305 and a second closure flap 310. The flaps 305, 310 are positioned adjacent to opposing sides of an opening 315 such that when unfurled, the flaps 305, 310 uncover at least a portion of the opening 315 disposed through a surface of a package. The opening 315 can include a frangible burst membrane 320 to preserve freshness of the contents of the bag for transport, retail display and to provide a tamper-evident indicator. The burst membrane 320 may also include preferential tear lines 323 to facilitate easier opening of the membrane 320.

An first array of fastening elements 325 is attached along a front face 330 of the free end 335 of the first closure flap 305. A second array of fastening elements 340 (FIG. 5B) is attached along a back face 345 of the free end 335 of the first closure flap 305 generally opposite the first array of fastening elements 325 on the front face 330. A third array of fastening elements 350 is attached along the front face 330 of the fixed end 355 of the first closure flap 305, positioned for engagement of the first fastening components 325 when the closure flap 305 is lifted away from the opening 315 and folded back onto itself.

A fourth array of fastening elements 360 is positioned along a front face 365 of a free end 370 of the second closure flap 310 for engagement with the second array of fastening elements 340 (FIG. 5B) when the free end 335 of the first closure flap 305 is extended across the opening

315. A fifth array of fastening elements 375 is positioned along the front face 365 of a fixed end 380 of the second closure flap 310 for engagement with the fourth array of fastening elements 360 when the free end 370 is folded downward to substantially uncover the opening 315.

In operation, the fastener 300 is opened by separating the free end 335 of the first closure flap 305 from the free end 370 of the second closure flap 310 thereby disengaging the second array of fastening elements 340 from the fourth array of fastening elements 360. The first closure flap 305 may be releasably secured away from the opening 320 so as not to inhibit access or passage of the contents of the package by engaging the first array of fastening elements 325 along the free end 335 with the third array of fastening elements 350 along the fixed end of the first closure flap 305. Similarly, the second closure flap 310 may be releasably secured away from the opening 320 by engaging the fourth array of fastening elements 360 with the fifth array of fastening elements 375 by folding the closure flap 310 to join its free and fixed ends 370, 380.

To reclose the fastener 300 the sequence is generally reversed, the free end 370 of the second closure flap 310 is separated from the fixed end 380 of the second closure flap 310 and extending upward to substantially cover the opening 320. The first closure flap 305 is extended across the second closure flap 310 (and temporarily held in position) until the second array of fastening elements 340 re-engages the fourth array of fastening elements 360 to reclose the opening 320.

Referring now to FIGS. 6A to 6H, a fastener 400 includes a closure flap 405 and a closure base 410 positioned adjacent to an opening 415 disposed through a surface of a package. In one embodiment, the closure base 410 may include an arcuate inner edge 412 for a contoured fit around the generally circular opening 415. The closure flap 405 includes a first array of fastening elements 420 attached to a back face 423 of a free end 425. A second array of fastening elements 430 (FIG. 6A) is attached to a front face 435 of the free edge 425 generally opposite at least a portion of the first array of fastening elements 420 on the back face 423 of the closure flap 405. A third array of fastening elements 440 is attached to the front face 435 of a fixed end 445 of the closure flap 405 positioned for engagement with the second array of fastening elements 430 when the free end 425 is folded downward toward the fixed end 445 to substantially uncover the opening 415.

A frangible burst membrane 460 may be provided across the opening 415 to preserve the freshness of the contents before the initial opening of the bag, for transport, retail display and to

provide a tamper-evident indicator. Alternatively, the burst membrane 460 may be provided over the fastener 400 with the closure flap 405 in an upward position (not shown). The burst membrane 460 may include a preferential tear line 465 to facilitate easier opening of the membrane 460.

In operation, the fastener 400 is opened by separating the free end 425 of the closure flap 405 from the closure base 410 disengaging the first and fourth fastening elements 420, 450. The free end 425 may be folded downward to engage the second array of fastening elements 430 with the third array of fastening elements 440 to releasably secure the closure flap substantially away from the opening 415 for uninhibited delivery or access of the contents of the package.

As shown in FIG. 6C, the free end 425 may be folded upward toward the closure base 410 and positioned to form a generally conical pour spout 427 for controlled delivery of the contents of the package. The closure base 410 includes a fourth array of fastening elements 450 for engagement with the first array of fastening elements 420 of the closure flap 405 (FIG. 6B).

In another example, shown in FIG. 6D, the conical pour spout 426 is configured for receiving a fitment 470. The inserted end of the fitment 470 is tapered for engaging an inner surface of the conical pour spout 427. The fitment 470 can facilitate the ingress or egress of the contents of the package, as will be described below. In one example, the pour spout 427 includes fastening elements (not shown) for engagement with the first array of fastening elements 420 attached to the back face of the closure flap 405. In another example, the conical pour spout 427 can be formed to establish a pressure-fit with the fitment 470.

Applications of the example of FIG. 6D include the controlled delivery of the powdered contents of a package, such as a container for copier or printer toner. As shown in FIGS. 6E and 6F, a toner container 500 includes an opening 415 for the delivery of toner contents to the copier. The closure flap 405 is separated from the closure base 410 and the fitment 470 is inserted into the now revealed opening 415. The fitment 470 can be the toner intake path for the copier. In one example, the closure flap 405 can be rolled back to engage fastening elements (not shown) on the fitment 470 to secure the fitment and/or reduce spillage of the toner. After the toner is substantially exhausted from the container 500, the closure flap 405 can be folded over the opening 415 to engage the first array of fastening elements 420 with the fourth array of fastening elements 450 to reduce spillage of any residual toner.

Another example includes the delivery of debris into vacuum bags. As shown in FIGS. 6G and 6H, a vacuum bag 510 includes an opening 415 for the delivery of debris into the bag. The closure flap 405 is separated from the closure base 410, the fitment 470 is inserted into the now revealed opening 415. The fitment 470 can be the vacuum connector which expels the vacuum debris. In one example, when the vacuum bag 510 is full, the closure flap can be folded over the opening to engage the first array of fastening elements 420 with the fourth array of fastening elements 450 for disposal of the bag 510 with spillage of the bag contents.

A number of embodiments of the invention have been described. Various embodiments are useful in many packaging applications, for example, the packaging closures described herein are useful for packaged food items, such as grain, meal, animal food, sugar, flour, produce, cookies and candy bars. It will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.